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BALLISTIC MISSILE DEFENSES AND U.S. NATIONAL SECURITY

SUMMARY REPORT

Fred S. Hoffman, *Study Director*

October 1983

Prepared for the

FUTURE SECURITY STRATEGY STUDY

FSSS

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Acknowledgments

This report is a summary of work performed by a Study Team whose members were: Mr. Fred S. Hoffman, Director; Mr. Leon Sloss, Deputy Director; Mr. Fritz Ermarth; Mr. Craig Hartsell; Mr. Frank Hoeber; Dr. Marvin King; Mr. Paul Kozemchak; Lt. Gen. C. J. LeVan, USA (Ret.); Dr. James J. Martin; Mr. Marc Millot; Mr. Lawrence O'Neill; and Dr. Harry Sauerwein. The work of the Study Team has been reviewed by a Senior Policy Review Group consisting of Professor John Deutch; Dr. Charles Herzfeld; Mr. Andrew W. Marshall; Dr. Michael May; Professor Henry S. Rowen; General John Vogt, USAF (Ret.); Ambassador Seymour Weiss; Mr. Albert Wohlstetter; and Mr. James Woolsey. Supporting papers have been contributed by Mr. Craig Hartsell, Dr. James J. Martin, Mr. John Baker, Lt. Gen. C. J. LeVan, Mr. Douglas Hart, Mr. Marc Millot, Dr. David S. Yost, Mr. Leon Sloss, and Mr. Frank Hoeber.

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Responsibility for the views expressed herein rests with the Study Team.

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Preface

President Reagan has directed an "effort to define a long-term research and development program...to achieve our ultimate goal of eliminating the threat posed by strategic nuclear missiles...." The President noted that the achievement of the ultimate goal was a "formidable technical task" that would probably take decades, and that "as we proceed we must remain constant in preserving the nuclear deterrent...maintaining a solid capability for flexible response...pursue real reductions in nuclear arms...(and) reduce the risk of a conventional military conflict escalating to nuclear war by improving our nonnuclear capabilities."

Two studies assisted in that effort: (1) the Defensive Technologies Study (DTS) to review the technologies relevant to defenses against ballistic missiles and recommend a specific set of long-term programs to make the necessary technological advances, and (2) the Future Security Strategy Study (FSSS) to assess the role of defensive systems in our future security strategy. The implications for defense policy, strategy, and arms control were addressed by two FSSS teams: an interagency team led by Mr. Franklin C. Miller, and a team of outside experts led by Mr. Fred S. Hoffman. This is a report on the results of the work of the team of outside experts. The work was done under the auspices of the Institute for Defense Analyses at the request of the Office of the Under Secretary of Defense for Policy to assist the interagency team.

This report and its conclusions do not necessarily represent the views of the Department of Defense or the Institute for Defense Analyses.

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SUMMARY REPORT

A. MAJOR CONCLUSIONS AND RECOMMENDATIONS

The Strategic Need for Defensive Systems

1. *U.S. national security requires vigorous development of technical opportunities for advanced ballistic missile defense systems.*

- Effective U.S. defensive systems can play an essential role in reducing reliance on threats of massive destruction that are increasingly hollow and morally unacceptable. A strategy that places increased reliance on defensive systems can offer a new basis for managing our long-term relationship with the Soviet Union. It can open new opportunities for pursuing a prudent defense of Western security through both unilateral measures and agreements. The Soviets have often used arms negotiations to pursue competitive military advantage. The Soviet Union is likely to cooperate in pursuing agreements that are mutually beneficial *only* if it concludes that it cannot accomplish its present political goals because it faces Western firmness and ability to resist coercion.

- Technologies for ballistic missile defenses, together with those for precise, effective, and discriminate nuclear and nonnuclear offensive systems, are advancing rapidly. They can present opportunities for resisting aggression and deterring conflict that are safer and more humane than exclusive reliance on the threat of nuclear retaliation.

- A satisfactory deterrent requires a combination of more discriminating and effective offensive systems to respond to enemy attacks plus defensive systems to deny the achievement of enemy attack objectives. Such a deterrent can counter the erosion of confidence in our alliance guarantees caused by the adverse shifts in the military balance since the 1960s.

- Readiness to deploy advanced ballistic missile defense systems is a necessary part of a U.S. hedge against the increasingly ominous possibility of one-sided Soviet deployment of such systems. Such a Soviet deployment, superimposed on the present nuclear balance, would have disastrous consequences for U.S. and allied security. Clearly this possibility, especially in the near term, also requires precautionary measures to enhance the ability of our offensive forces to penetrate defenses.

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The Preferred Path to the President's Goal: Intermediate Options

2. *The new technologies offer the possibility of a multilayered defense system able to intercept offensive missiles in each phase of their trajectories.* In the long term, such systems might provide a nearly leakproof defense against large ballistic missile attacks. However, their components vary substantially in technical risk, development lead time, and cost, and in the policy issues they raise. Consequently, partial systems, or systems with more modest technical goals, may be feasible earlier than the full system.

3. *Such "intermediate" systems may offer useful capabilities.* The assessment in this study of the utility of intermediate systems is necessarily tentative, owing to the current lack of specificity in systems design, effectiveness and costs. Nevertheless, it indicates that, given a reasonable degree of success in our R&D efforts, intermediate systems can strengthen deterrence. They will greatly complicate Soviet attack plans and reduce Soviet confidence in a successful outcome at various levels of conflict and attack sizes, both nuclear *and nonnuclear.* Even U.S. defenses of limited capability can deny Soviet planners confidence in their ability to destroy a sufficient set of military targets to satisfy enemy attack objectives, thereby strengthening deterrence. Intermediate defenses can also reduce damage if conflict occurs. The combined effects of these intermediate capabilities could help to reassure our allies about the credibility of our guarantees.

4. *A flexible research and development (R&D) program designed to offer early options for the deployment of intermediate systems, while proceeding toward the President's ultimate goal, is preferable to one that defers the availability of components having a shorter development lead time* in order to optimize the allocation of R&D resources for development of the "full system."

- Intermediate defense systems can help to ameliorate our security problems in the interim while full systems are being developed.

- The full-system approach involves higher technical risk and higher cost. On the other hand, an approach explicitly addressing the utility of intermediate systems offers a hedge against the possibility that nearly leakproof defenses may take a very long time, or may prove to be unattainable in a practical sense against a Soviet effort to counter the defense.

- The deployment of intermediate systems would also provide operational experience with some components of later, more comprehensive, and more advanced defense systems, increasing the effectiveness of the development effort.

5. We have considered several possible intermediate options:

- *Anti-Tactical Missile (ATM) Options*

  Deployment of an anti-tactical missile (ATM) system is an intermediate option that might be available relatively early. The system might combine some advanced mid-course and terminal components identified by the Defensive Technologies Study with

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a terminal underlay. The advanced components, though developed initially in an ATM mode, might later play a role in continental United States (CONUS) defense. Such an option addresses the pressing military need to protect allied forces as well as our own, in theaters of operations, from either nonnuclear or nuclear attack. It would directly benefit our allies as well as ourselves. Inclusion of such an option in our long-range R&D program on ballistic missile defenses should reduce allied anxieties that our increased emphasis on defenses might indicate a weakening in our commitment to the defense of Europe. We can pursue such a program option *within ABM Treaty constraints*. Such a course is therefore consistent with a policy of deferring decisions on modifying or withdrawing from the treaty.

- *Intermediate CONUS Options*

  Intermediate capabilities may also have important applications in CONUS, initially to defend critical installations such as C^3I nodes. As the defense system is thickened, it also will add to Soviet uncertainties in targeting, even in large-scale attacks, thereby enhancing deterrence. Depending on rates of progress in the R&D program, a two-phase defense of high effectiveness against moderate threats might comprise both endoatmospheric and exoatmospheric components employing space-based sensors and ground-based interceptors. These intermediate components would be the lower tiers in a full multilayered system.

- *Limited Boost-Phase Intercept Options*

  Some intermediate options may provide useful near-term leverage on Soviet plans and programs even if they prove unable to meet fully sophisticated Soviet responses. An early boost-phase intercept system with capability against large rockets similar to those that are an important part of Soviet forces may be one example. Such an option could impose costs on the Soviets and increase their incentive to move toward an offensive posture that is more stable and less threatening. A definitive assessment of the utility of such options must specify their technological and political feasibility, timing, and cost, and the ease with which they can be countered.

6. Pursuit of the President's goal, especially if it is interpreted solely in terms of the full, nearly leakproof system, will raise questions about our readiness to defend against other threats, notably that of air attack by possible advanced bombers and cruise missiles. An appropriate response to such questions will require an early and comprehensive review of air defense technologies, leading to the development of useful systems concepts.

Defensive Systems and Stability of Deterrence

7. Deployment of defensive systems can increase stability, but to attain this goal we must design our offensive and defensive forces properly; especially, we must not allow them to be vulnerable. In combination with other measures, defenses can contribute to reducing the prelaunch vulnerability of our offensive forces. To increase stability, defenses must themselves avoid high vulnerability, must be robust in the face of enemy technical or tactical countermeasures, and must compete favorably in cost with expansion of the Soviet offensive force.

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8. As currently assessed, some boost-phase intercept systems and other space-based components pose serious policy problems, because of engagement time constraints. Space-based components may also be highly vulnerable to Soviet boost-phase intercept systems, or anti-satellite (ASAT) systems. It will be imperative to design systems which are not themselves subject to rapid attack. Alternative approaches need to be developed in the R&D program that permit safe arrangements for the operation of the defensive system.

Soviet Policies, Initiative, and Responses

9. *The common assumption that the decision to initiate widespread deployment of ballistic missile defense systems rests with the United States alone is completely unjustified.* Soviet history, doctrine, and programs all indicate that the Soviets are likely (and better prepared than we) to initiate a widespread antiballistic missile (ABM) deployment whenever they deem it to their advantage.

10. The long-term course of Soviet military policy plans and programs is uncertain in detail, but unless there is a major change in their political goals, the Soviets are highly likely to continue to aim at being able to defeat any combination of external enemies.

- The Soviets will almost certainly continue to maintain and upgrade their large air defenses and to conduct programs for R&D and modernization of their ballistic missile defenses. These activities will increasingly create uncertainty about the ability of U.S. missile forces to penetrate without countermeasures, and about the possibility of a sudden (open) or gradual (clandestine) Soviet breakout from the ABM Treaty constraints. The importance of such uncertainty is intensified because of the substantial Soviet investments in air defense and passive defenses of elements of the Soviet military and government. Even without violating ABM Treaty constraints, the Soviets will probably deploy a substantial ATM defense, exacerbating our problems in theaters of operations and making them more difficult to correct.

- On the other hand, if the Soviets believe that a Western deployment of defenses will substantially improve the West's capability to resist attack or coercion, they will try to prevent a Western deployment through political means or arms negotiations.

- If the United States deploys defensive systems, the Soviets will probably seek to maintain their offensive threat through a set of measures that will depend on their assessment of the defenses and their own technological options. Depending on the defense effectiveness and leverage, such a response may not fully restore Soviet offensive capabilities.

- If, over time, the Soviets become convinced that the West has the resolve and ability to block Soviet achievement of their long-term goals of destabilization and domination of other states, they may move from their present political/military policies to become more willing to agree to reducing the nuclear threat, through a combination of mutual restrictions on offensive forces and deployment of defensive systems.

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B. SUPPORTING RATIONALE

President Reagan's directive to assess the role of defensive systems has required the FSSS to consider the relation of these systems to our strategic objectives and to Soviet programs and policy. The role of intermediate defensive systems has been a major focus of our study.

1. *The Need for Defensive Systems in our Security Strategy*

There is a broad consensus that reliance on nuclear retaliatory threats raises serious political and moral problems, particularly in contingencies where the enemy use of force has been constrained. Technologies for defensive systems and those for extremely precise and discriminating attacks on strategic targets have been advancing very rapidly. (Many technologies are common to both functions.) Together they offer substantial promise of a basis for protecting our national security interests, and those of our allies, that is more humane and more prudent than sole reliance on threats of nuclear response. The case for increasing the emphasis on defensive programs in our national security strategy rests on several grounds, in addition to the broad, long-term objectives mentioned by the President in his March 23 speech:

- The massive increase in Soviet power at all levels of conflict is eroding confidence in the threat of U.S. nuclear response to Soviet attacks against our allies. A continuation of this erosion could ultimately undermine our traditional alliance structure.

- If the Soviet Union persists in the buildup of nuclear offensive forces, for the next decade and beyond the United States may not wish to restore, by offensive means alone, a military balance consistent with our strategic needs. Soviet willingness and ability to match or overmatch increases in U.S. nuclear forces suggest that while additions to our forces are needed to maintain the continued viability of our nuclear deterrent, such additions alone may not preserve confidence in our alliance guarantees.

- The public in the United States and other Western countries is increasingly anxious about the danger of nuclear war and the prospects for a supposedly unending nuclear arms race. Those expressing this anxiety, however, frequently ignore the fact that

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the U.S. nuclear stockpile has been declining, both in numbers and in megatons, while Soviet forces have increased massively in both. A U.S. counter to the Soviet buildup that emphasized increases in U.S. nuclear stockpiles would exacerbate public anxieties.

- Arms agreements, despite widespread Western hopes for them, have to date failed to prevent growing instability in the balance—and the deterioration—in the Western position relative to the East. Offensive force limitation agreements, originally associated in the U.S. arms control strategy with the ABM Treaty, have failed to restrain the Soviet offensive buildup; *de facto* reductions in the explosive yield and size of U.S. strategic nuclear stocks have not prevented vast increases in the size and destructiveness of the Soviet stockpile.

- Rapidly advancing technologies offer new opportunities for active defense deployment against ballistic missile attack that did not exist when, over a decade ago, the United States abandoned plans for defense deployments against nuclear attack. Technologies for sensing and discrimination of targets, directing the means of intercept, and destroying targets have created the possibility of a system of layered defenses that would pose successive, independent barriers to penetrating missiles. There has been improvement in some (not all) aspects of defense vulnerability. Given successful outcomes to development programs and robustness in the face of Soviet countermeasures, such defenses would permit only a very small proportion of even a very large attacking ballistic missile force to reach target. Such defenses might also offer high leverage in competing with offensive responses.

2. *Ballistic Missile Defenses in the Soviet Union*

The Soviets maintain a high level of activity in programs relevant to defenses against nuclear attack including:

- Active programs for modernizing deployed air and ballistic missile defense systems which together give them the basis for a very rapid deployment of widespread ballistic missile defenses, if they decide to ignore ABM Treaty obligations completely and openly.

- Large and diverse R&D programs in areas of technology for advanced ballistic missile and air defense systems.

- A space launch capacity significantly greater than our own, if not as sophisticated.

A substantial Soviet lead in deployed defensive systems, superimposed on their growing offensive threat against our nuclear offensive forces, could destroy the stability of the strategic balance.

The decision to initiate widespread deployment of ballistic missile defenses does not rest with the United States alone. The common assumption that it does is completely unjustified. The Soviets give every appearance of preparing for such a deployment whenever they believe

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they will derive significant strategic advantage from doing so. Their activities include some that are questionable under the ABM Treaty. Unless the public is aware and kept aware of Soviet activities in this area, the United States will probably be blamed for initiating "another round in the arms race." The state of U.S. preparedness to deploy capable defenses will be an important element in the Soviets' assessment of their own options. Active U.S. R&D programs on advanced defensive systems can assist in deterring a Soviet deployment designed to exploit an asymmetry in their favor.

3. *Alternative Paths to the President's Objective*

The path to the President's ultimate objective may be designed to go directly toward the ultimate objective of a full, multilayered system that offers nearly leakproof defenses against very large offensive forces. Under some conditions such a path might be an optimal use of limited R&D resources, concentrating first on those technologies that present the greatest difficulty and require the greatest lead times.

Alternatively, R&D programs might be designed to provide earlier options for the deployment of intermediate systems, based on technologies that can contribute to the ultimate objective, as such systems become technically feasible and offer useful capabilities. Such a path toward the President's ultimate goal might generate earlier funding demands to support deployment of intermediate systems and would require early treatment of some of the policy issues. Also, at least one variant considered in our report, an ATM deployment for theaters of operations, could be undertaken without modification of the ABM Treaty.

The principal benefits of an R&D path providing options for earlier, partial deployments are:

- Possibilities for an early contribution to improving the deteriorating military balance.
- Its explicit provision of a hedge against the risks inherent in a program where each of a large number of demanding technological goals must be met in order to realize any useful result at all.
- The likelihood that early deployments of parts of the ultimate system may also prove to be the most effective path to achieving such a system; early operational experience with some system elements can contribute useful feedback to the development process.

4. *Intermediate Defensive Systems, Soviet Strategy, and Deterrence*

Fundamentally, the choice between the two paths depends on the utility of intermediate systems in meeting our national security objectives. In the discussion of ballistic missile defenses that preceded the U.S. proposal of the ABM Treaty, opponents of such defenses argued that the utility of widespread defense deployments should be judged in terms of their ability to protect population from large attacks aimed primarily at urban-industrial areas. Because of the destructiveness of nuclear weapons, nearly leakprook defenses are required to provide a high level of protection for population against such attacks. Moreover, opponents at that time also divided our strategic objectives into two categories: deterrence of war and limiting

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damage if deterrence failed. They relegated defenses exclusively to the second objective and ignored the essential complementarity between the two objectives. Consequently, they assigned defenses no role in deterrence.

We have reexamined this issue, and we conclude that defenses of intermediate levels of capability can make critically important contributions to our national security objectives. *In particular, they can reinforce or help maintain deterrence by denying the Soviets confidence in their ability to achieve the strategic objectives of their contemplated attacks as they assess a decision to go to war.* By strengthening deterrence *at various levels of conflict,* defenses can also contribute valuable reassurance to our allies.

Deterrence rests on the Soviets' assessment of their political/military alternatives. This, in turn, depends on their objectives and style in planning for and using military force. It also depends on their estimates of the effectiveness of weapons and forces on both sides. Soviet assessments on these matters may differ sharply from our own. Specifically, the past behavior of the Soviets suggests they credit defensive systems with greater capability than we do. If true, this will increase the contribution of defensive systems to deterrence.

Because of the long lead times, assessment of the strategic role of defenses also requires very long-term projections about the nature of the Soviet state. While such projections cannot be made with confidence, there is no current basis for projecting a fundamental change in the Soviet attitude toward external relations. We consider below the possibility that appropriate management by the West of its long-term relations with the Soviets might induce a fundamental change. Desirable as this goal is, the most probable projection for the foreseeable future is that they will continue to set a high priority on their ability to control, subvert, or coerce other states as the basis for their foreign relations. In this case, military power will continue to play a major role for the Soviets, and many present elements of style in the application of that power can be expected to persist:

- Domination of the Eurasian periphery is a primary strategic objective. The Soviets' preferred mode in exploiting their military power is to apply it to deter, influence, coerce—in short, to control—other states, if possible without combat. But the ability to so apply this power depends on strength in actual combat.

- The Soviet objective in combat is victory, defined as survival of the Soviet state and military power (with as little damage as possible) and the imposition of the Soviet will on opponents. Soviet doctrine and practice contemplate limited war, viewed in terms of Soviet ability to impose limitations on opponents for Soviet strategic advantage.

- Soviet plans unite the roles of various elements of military forces in a coherent strategic architecture, embracing offense, defense, and combined arms in various theaters of operations. Destruction of an enemy is subordinate to the achievement of the goal of victory. The Soviets' concept for use of strategic offensive and defensive capability is, consequently, to deter attacks by U.S. intercontinental forces, to separate the United States from its allies in the Eurasian periphery, and to limit damage in the event that U.S. offensive forces are used against the Soviet Union.

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- Uncertainty is a dominant factor in all combat, creating an unlimited demand for superiority in forces. Soviet planners seek ways to control uncertainty but, faced with uncertainty over which they cannot exercise a high degree of control, Soviet military action may be deterred. Uncertainties are particularly important in technically complex interactions between offense and defense.

Such a view of military force and its political applications may appear inconsistent with Soviet threats of inevitable apocalyptic destruction in the event of war at any level—but such threats are intended to play on the fears of the Western public. While very great destruction might in fact result from Soviet attacks, the discussion above suggests that the Soviets give priority to military targets. In the absence of defenses, their massive offensive forces make it possible for them to attack large numbers of targets, including urban-industrial targets as well as high-priority military targets.

Whether they would conduct such attacks from the outset or withhold attacks against urban-industrial targets to deter U.S. retaliation must be a matter of conjecture. In any case, intermediate levels of defense capability might deny them the ability to destroy with high confidence all of their high-priority targets and force them to concentrate their attack on such targets, diverting weapons that might otherwise be directed against cities. Moreover, if defenses can deny the Soviets confidence in achievement of their military attack objectives, this will strengthen deterrence of such attacks. Thus, to the extent that such attacks are necessary to overall Soviet plans, defenses can help deter lower levels of conflict.

5. *The Military Utility of Intermediate Defensive Systems*

Defensive systems affect attack planning in a variety of ways, depending on the characteristics and effectiveness of the defenses, the objectives of the attack, and the responses of the defense and offense to the measures adopted by the other side.

Any defense system can be overcome by an attack large enough to exhaust the intercept capability of the defense. The size of attack against which the defense is designed is therefore one major characteristic of a defensive system. The cost of expanding the defense to deal with a given increase in the size and cost of the offense is a measure of the leverage of the defense. Another characteristic is its effectiveness—its probability of destroying an offensive missile.

If the defense has sufficiently high capacity, effectiveness, and leverage, it can of course essentially preclude attacks. Such defenses may result from the R&D programs pursuant to the President's goal, but it is more likely that the results will be more modest. Even a modest level of effectiveness—for example, a kill probability of 0.5 for each layer of a four-layer defense—yields an overall "leakage" rate of only about 6 percent for an attack size that does not exceed the total intercept capacity of the various layers. Such a leakage rate is, of course, sufficient to create catastrophic damage in an attack of, say, 5,000 reentry vehicles (RVs) aimed at cities. It would mean 300 RVs arriving at targets—sufficient to destroy a very large part of our urban structure and population even if distributed in a nonoptimal fashion from the point of view of the offense.

Against an extensive military target system, however, with an attack objective of destroying large fractions of specific target sets (such as critical C^3I facilities) with high confidence,

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such a leakage rate would be totally inadequate for the offense. The more specific the attack objectives and the higher the confidence required by the offense, the greater the leverage exacted by the defense. For example, in the previous four-layer case, if the defense required a high-confidence penetration against a specific target, it would need to fire at least 30 RVs to a single target since the defense firing doctrine is unknown to the attacker. As these are expected-value calculations, an attacker would have to double or triple the above values to attain high confidence in killing a specific target. Clearly an attacking force of 5,000 RVs that could destroy a very large military target system in the absence of defenses would be totally inadequate to achieve high confidence of destruction of a large fraction of a defended target set amounting to hundreds of targets. Yet, this is precisely what is required to achieve the strategic objectives of a large-scale nuclear attack.

The situation is even more dramatic in the case of limited attacks on restricted target systems, intended to achieve a decisive strategic advantage while continuing to deter further escalation of the level of nuclear attack. Such attacks would be precluded entirely by defenses of the sort discussed, would deny the attacker's confidence in the outcome, or would require a level of force inconsistent with limiting the level of violence, while depleting the attacker's inventory available for other tasks.

Offense and defense have a rich menu of responses from which they can choose. These include fractionation of payload to increase the number of warheads for a given missile force, the use of decoys, and the use of preferential offense or defense tactics. The outcome of the contest is likely to be uncertain to both sides so long as the defense keeps pace with additions to offensive force size by expanding its intercept capacity and upgrading its critical subsystems. Uncertainty about the offense-defense engagement itself contributes to deterrence of attack by denying confidence in the attack outcome.

We have considered the effect of introducing defenses in hypothetical representative military situations, taking account of what we know of Soviet objectives and operational style in combat. In their doctrine, the Soviets stress operations designed to bring large-scale conflict to a quick and decisive end, at as low a level of violence as is consistent with achievement of Soviet strategic aims. To achieve this objective in a conflict involving NATO, a major aspect of their operations is intense initial attacks on critical NATO military targets in the rear, particularly those relevant to NATO's theater nuclear capabilities and air power. Such attacks (including those in the nonnuclear phase of combat) are intended to contribute to Soviet goals at that level, to reduce NATO's ability and resolve to initiate nuclear attacks if the nonnuclear defense fails to hold, and to assist in nuclear preemption of a NATO nuclear attack. High confidence in degrading NATO air power is also essential to support utilization of Soviet operational maneuver groups designed to disrupt NATO rear areas.

The Soviets plan to use a wide variety of means to accomplish this task. Tactical ballistic missiles (TBMs) are taking an increasing role in this mission during the initial stages of either nuclear or nonnuclear combat as their accuracy increases and the sophistication of high-explosive warheads increases. Inability to destroy critical target systems would cast doubt on the feasibility of the entire Soviet attack plan, and so contribute to deterrence of theater combat, nuclear or nonnuclear.

In the event of imminent or actual large-scale conflict in Europe, another high-priority Soviet task would be to prevent quick reinforcement and resupply from the United States.

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Early and obvious success in this respect, by demonstrating the hopelessness of resistance, might abort European resistance altogether or end a conflict in its very early stages. In the absence of defenses, the Soviets might attempt this task by nonnuclear tactical ballistic missile attacks on reception facilities in Europe. The Soviets could also accomplish this task with higher confidence by means of quite limited nuclear attacks on such facilities in Europe and on a restricted set of force projection targets in CONUS.

While the risk of provoking large-scale U.S. response to nuclear attacks on CONUS might be unacceptable to the Soviets, they might also feel that—given the stakes, the risks of escalation if conflict in Europe is prolonged, and the strength of their deterrent to U.S. initiation of a large-scale nuclear exchange—the *relative* risks might be acceptable if the attack size were small enough and their confidence of success sufficiently high. Without defenses, very small numbers of ballistic missiles could in fact achieve high confidence in such an attack. However, an intermediate ballistic missile defense deployment of moderate capabilities could force the Soviets to increase their attack size radically. This would reduce or eliminate the Soviets' confidence that they could achieve their attack objectives while controlling the risks of a large-scale nuclear exchange. The role of intermediate defenses in large-scale nuclear attacks has already been discussed at the beginning of this section.

Soviet response to prospective or actual defense deployments by the United States also will have longer-run aspects. The Soviets' initial reaction will be to assess the nature, effects, and likelihood of a U.S. defense deployment. Barring fundamental changes in their conception of their relations to other states and their security needs, they will seek to prevent such a deployment through manipulation of public opinion or negotiations over arms agreements. (We consider the possibility of a fundamental change in Soviet political/military objectives in the discussion of arms agreements below.)

If the Soviets fail to prevent the deployment of defenses, they will assess their alternative responses in the light of the strategic architecture discussed above, the effectiveness and leverage of the U.S. ballistic missile defenses, and other relevant U.S. offensive and defensive capabilities (e.g., air defense). If the new defensive technologies offer sufficient leverage against the offense and they cannot prevent the West from deploying defensive systems, the Soviets may accept a reduction in their long-range offensive threat against the West, which might be reflected in arms agreements. In this case, they would probably seek to compensate by increasing their relative strength in other areas of military capability. Their current program emphases suggest that they would be more likely to respond with a continuing buildup in their long-range offensive forces. However, such a buildup would not necessarily be sufficient to maintain their current level of confidence in the achievement of the strategic objectives of those forces.

6. *Managing the Long-Term Competition with the Soviet Union*

Current Soviet policy on arms agreements is dominated by the Soviet Union's attempt to derive unilateral advantage from arms negotiations and agreements, by accepting only arrangements that permit continued Soviet increases in military strength while using the negotiation process to inhibit Western increases in military strength. There is no evidence that Soviet emphasis on competitive advantage over mutual benefit will change in the near future, unless a fundamental change occurs in the Soviet Union's underlying foreign policy objectives. Such

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a change might be induced in the long run by a conviction among Soviet leaders that the West was able and resolved to block the Soviet Union's attempts to extend its power and influence by reliance on military strength. If such a change occurred, the possibilities for reaching much more substantial arms agreements might increase. In that event, it might also be possible to reach agreements restricting offensive forces so as to permit defensive systems to diminish the nuclear threat. Soviet belief in the seriousness of U.S. resolve to deploy such defenses might itself contribute to such a change.

7. *Defenses and Stability*

Deployment of defensive systems can increase stability, but to attain this we must design our offensive and defensive forces properly—and, especially, we must not allow them to be vulnerable. In combination with other measures, defenses can contribute to reducing the prelaunch vulnerability of our offensive forces. To increase stability, defenses must themselves avoid high vulnerability, must be robust in the face of enemy technical or tactical countermeasures, and must compete favorably in cost terms with expansion of the Soviet offensive force. A defense that was highly effective for an attack below some threshold but lost effectiveness very rapidly for larger attacks might decrease stability if superimposed on vulnerable offensive systems. Boost-phase and midcourse layers may present problems of both vulnerability and high sensitivity to attack size. Nevertheless, if this vulnerability can be limited through technical and tactical measures, these layers may constitute very useful elements of properly designed multilayered systems where their sensitivity is compensated by the capabilities of other system components.

8. *A Perspective on Costs*

We do not yet have a basis for estimating the full cost of the necessary research program nor the cost of systems development or various possible defensive deployment options. It is clear, however, that costs and the tradeoffs they require would present important issues for defense policy. While not insignificant, total systems costs would be spread over many years. There is no reason at present to assume that the potential contributions of defensive systems to our security would not prove sufficient to warrant the costs of deploying the systems when we are in a better situation to assess their costs and benefits.

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